Manitoba Agriculture

formation Update

Guidelines For Estimating

Swine Hoop Shelter Finishing Costs

Based On Marketing 11527 Pigs Sold From 16 Shelters

DATE: December, 2000

This publication is intended to provide a format and a set of guidelines for determining the costs of production of a hoop shelter housing system for a finishing (23-113 kg) enterprise. The numbers are estimates of production costs and not figures obtained from an actual survey of the pork production industry in Manitoba. The assumptions on which the costs are based are outlined in the supporting pages. These assumptions were arrived at using the management practices, and facilities seen in modern, well-managed hoop shelter swine operations of comparable size in Manitoba. Productivity and performance assumptions are based on information collected by department specialists, feed companies and other organizations. Adjustments will be necessary where individual productivity and performance levels differ from those listed.

A hoop shelter is a quonset-shaped building with sidewalls made from wood planks and posts. Steel arches are fastened to the posts to form a hooped roof, which is covered by a UV resistant tarp (See Figure 1 Page 14). Most hoop structures have a deep-bedded earthen floor except for a concrete pad section containing the feed bin and waterer (See Figure 2 Page 14). These naturally ventilated structures are often sited in an east-west orientation in Manitoba to take advantage of our prevailing wind conditions.

Hoop shelters have been used for several years in Manitoba and have potential benefits for pigs and producers including: 1) they are low capital (fixed) costs facilities, 2) they are flexible, practical and can be used or adapted for other purposes, 3) hoop shelters provide an environment for pigs with bedding (usually straw) and allow for group interactions among pigs, and 4) hoop shelters provide a working environment with lower levels of manure gases and a solid (straw based) manure handling system.

Accurate, up-to-date, production and financial records are essential for the effective application of these guidelines to an individual operation. Without such information accurate cost of production projections cannot be determined.

Swine Hoop Shelter Finishing Cost of Production

The following 23-113 kg budget is based on the assumption that all feed rations are purchased. The budget also includes a land investment cost based on the assumption that 160 acres would be required for this size operation, with 140 acres rented out at $25 per acre.

The budget includes an assumption that 1.5% of the market pigs are sold as lightweight pigs. It is assumed that when the lightweight pigs are sold, they will have a salvage value. Therefore, total marketings are reduced by 1% to compensate for the lightweight

The budget also includes an assumption that this particular hoop shelter operation is "all-in, all-out" by shelter. Each shelter is designed to house 250 growing/finishing pigs. The budget includes an assumption that five hundred (500) pigs will be delivered on site every two weeks. This will provide enough 23-kg pigs to fill two shelters at a time. Marketing of pigs will also be completed on a two to three week schedule. Once the market pigs are all removed from a shelter, the manure pack is cleaned out and the shelter is re-strawed with 12 to 15 large (700 kg) round or square bales. A producer can expect to finish three batches (cycles) of pigs per year per hoop shelter.

The suggested space allocation for finishing pigs in a hoop shelter is 1.1 square metres (12 square feet) per pig.

The rations illustrated in this budget are examples only. Individual farm conditions should be taken into account when formulating the diets. Producers need to know the feed intakes of their animals. Pigs will consume approximately 10% more feed in a hoop shelter than in a confinement system during the winter (1 batch), whereas feed intakes will be approximately the same as in a confinement system for the remainder of the year (2 batches). Please consult with a nutritionist for diet information suggestions.

The Manitoba pork production industry profile is changing and this budget was specifically designed to address the need of producers who may want to analyze the cost of starting up or switching to a hoop shelter finishing 23-113 kg operation. Several companies are offering contracts with varying levels of guarantees. Producers need to accurately calculate their costs before they can properly make a decision.

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Swine Hoop Shelter Finishing Cost of Production Summary

Operating Costs	$/Pig Sold	Total Cost	Your Cost
1. Feed Costs:			
1.01 Grower Ration #1	18.64	214,812	
1.02 Grower Ration #2	18.74	216,000	
1.03 Finisher Ration	23.50	270,864	
Total Feed Cost	**$60.87**	**$701,676**	
2. Other Operating Costs:			
2.01 Weanling Cost	56.27	648,603	
2.02 Straw	2.43	28,029	
2.02 Veterinary Medicine & Supplies	1.65	19,000	
2.03 Maintenance & Repairs	0.25	2,911	
2.04 Hydro & Propane	0.09	1,000	
2.05 Insurance	0.36	4,198	
2.06 Manure Costs	2.60	30,000	
2.07 Office Supplies	0.10	1,166	
2.08 Marketing & Transport	5.59	64,437	
2.09 Property Tax	0.07	827	
Subtotal Operating Costs	$130.29	$1,501,847	
2.10 Interest on Operating Costs	2.61	30,047	
Total Operating Costs	**$132.89**	**$1,531,894**	
Fixed Costs			
3. Depreciation:			
3.01 Buildings & Manure Storage	1.57	18,066	
3.02 Equipment	0.65	7,484	
Total Depreciation Cost	**$2.22**	**$25,550**	
4. Investment:			
4.01 Land	0.30	3,500	
4.02 Buildings & Manure Storage	0.39	4,516	
4.03 Equipment	0.20	2,310	
4.04 Professional Services	0.07	750	
Total Investment Cost	**$0.96**	**$7,576**	
Total Fixed Costs	**$3.18**	**$33,126**	
5. Labour			
Wages, benefits and hired manager	3.57	41,184	
Total Cost of Production	**$139.64**	**$1,606,204**	

Break-Even Price (carcass) [1]	**$/100 kg**	**$/cwt**	
Operating Cost	$131.99	$59.87	
Operating & Labour Cost	$135.54	$61.48	
Operating, Labour & Fixed Cost	$138.70	$62.91	

[1] Break-even Price = Cost per Hog Sold / (Slaughter Weight X Dressing Percentage X Index)

Swine Hoop Shelter Finishing Production Cost Assumptions

1. This input table outlines the cost of production for a finishing enterprise.
2. Buildings and equipment are valued at new cost.
3. Purchased feed is used.
4. Manure haulage is contracted out.
5. Livestock values are based on a market price for pork of:

	$135.00	/100 kg	**110**	Market Index
or:	$0.61	/lb	**81**	% Dress

Indicators of Productivity

	Grower 1	Grower 2	Finish	Total
Number of Pigs Purchased Annually	**12,000**	11,880	11,761	12,000
Average Beginning Weight (kg)	**23.0**	50.0	80.0	23
Average Ending Weight (kg)	**50.0**	**80.0**	**113.0**	113
Percent Mortality	**1.00**	**1.00**	**1.00**	3.00
Days on Feed	**36**	**30**	**43**	109
Feed Conversion Ratio	**2.60**	**3.00**	**3.60**	3.10
Number of Pigs (Ending)	11,880	11,761	11,644	11,644
Weight Gain/Pig (kg)	27.0	30.0	33.0	90.0
Feed Disappearance/Pig (kg)	70.2	90.0	118.8	279.0
Average Daily Gain (kg)	0.750	1.000	0.767	0.826
Average Number Pigs in Shelters	3,925	3,886	3,847	3,886

Productivity Profile	**Total**		
Pigs Purchased	12,000		
Pigs Died	360	3.0	% mortality
Pigs available for marketing	11,644		
Less Light Weight Pig Adjustment	116	**1.00**	%
Pigs Sold at full market value	11,527		
Washing and restocking days	**11**		
Total Days to Market	120		
Turnover (365 / days to market)	3.04		
Pigs per shelter	**250**		
Shelters required	16		

Feed Requirements and Costs

			Ration Cost		
	FCR *	kg/pig	Purchased	Home-Mixed	
Grower 1 Ration	2.60	70.2	**$255.00**	$0.00	/tonne
Grower 2 Ration	3.00	90.0	**$200.00**	$0.00	/tonne
Finish Ration	3.60	118.8	**$190.00**	$0.00	/tonne

*** FCR = Feed Conversion Ratio (Feed:Gain)**

Labour

Total Hours per year	**66.0**	hours/week	3,432	hours/year
Wage (includes hired manager)	**$12.00**	/hour (weighted)		

Capital Investment[1]

4,000 **Pig Places**

			Total	/Pig Place	Your Cost
Buildings					
Shelters	16 @	**$10,791**	$172,656	$43.16	
Office & Loading	200 ft.^{2}	**$25.00**	$5,000	$1.25	
Standby Generator			$3,000	$0.75	
Feed Mill (building only)			**$0**	$0.00	
Total Building Cost			**$180,656**	**$45.16**	
Equipment					
Skid Steer loader			$20,000	$5.00	
Tractor			$50,000	$0.00	
Snow Blower			$3,000		
Auto sorter (2 @ $5,500)			$11,000	$2.75	
Storage Bins			$0	$0.00	
Feed Mill (equipment only)			**$0**	$0.00	
Total Equipment Cost			**$84,000**	**$21.00**	
Total Buildings and Equipment Cost			**$264,656**	**$66.16**	
Land Value					
Land Investment	**160** acres @	**$500**	**$80,000**	**$10,000**	**$2.50**
Rental Income	**140** acres @	**$25**			
Other Costs					
Site preparation (includes manure storage)			**$30,000**	$7.50	
Manure Storage			**$0**	$0.00	
Total Other Costs			**$30,000**	**$7.50**	
Total Capital Investment			**$304,656**	**$76.16**	

Feed Ingredient Costs

	Price/tonne	Your Cost
Barley	$110.00	
Corn	$120.00	
Soybean Meal - 47 %	$315.00	
Vegetable Oil	$920.00	
Limestone	$80.00	
Dical (16-21)	$465.00	
Salt - 96%	$120.00	
G/F Micro	$2,500.00	
Lysine HCL	$2,500.00	
Threonine	$6,100.00	
Processing Cost (Hydro, Repairs/Maintenance & Insurance)	$3.25	
Percent Weight loss due to processing	1.25 %	
Labour Cost	$4.00	

Ration Formulas

	Grower #1 Ration (kg)	Grower #2 Ration (kg)	Finisher Ration (kg)
Barley	468.92	630.37	858.03
Corn	280.01	187.40	0.00
Soybean Meal - 47 %	214.85	148.69	110.00
Vegetable Oil	10.00	10.00	10.00
Limestone	12.94	10.37	11.47
Dical (16-21)	5.99	6.47	3.99
Salt - 96%	3.50	3.50	3.50
G/F Micro	3.00	3.00	3.00
Lysine HCL	0.75	0.20	0.02
Threonine	0.04	0.00	0.00
Total	1,000.00	1,000.00	1,000.01

Feed Requirement and Cost Summary

Grower Ration #1:	Amount (kg)	Ingredient Price ($ /tonne)	Ration Cost ($ /tonne)	Your Cost
Barley	468.9	$110.00	$51.58	
Corn	280.0	$120.00	$33.60	
Soybean Meal - 47 %	214.9	$315.00	$67.68	
Vegetable Oil	10.0	$920.00	$9.20	
Limestone	12.9	$80.00	$1.04	
Dical (16-21)	6.0	$465.00	$2.79	
Salt - 96%	3.5	$120.00	$0.42	
G/F Micro	3.0	$2,500.00	$7.50	
Lysine HCL	0.8	$2,500.00	$1.88	
Threonine	0.0	$6,100.00	$0.24	
Total	**1,000.0 kg**		**$175.93**	
Adjusted For Weight Loss		1.25 %	$178.13	
Plus Processing Cost		$3.25	$181.38	
Plus Labour Cost		$4.00	**$185.38**	
Grower Ration #2:				
Barley	630.4	$110.00	$69.34	
Corn	187.4	$120.00	$22.49	
Soybean Meal - 47 %	148.7	$315.00	$46.84	
Vegetable Oil	10.0	$920.00	$9.20	
Limestone	10.4	$80.00	$0.83	
Dical (16-21)	6.5	$465.00	$3.01	
Salt - 96%	3.5	$120.00	$0.42	
G/F Micro	3.0	$2,500.00	$7.50	
Lysine HCL	0.2	$2,500.00	$0.50	
Threonine	0.0	$6,100.00	$0.00	
Total	**1,000.0 kg**		**$160.13**	
Adjusted For Weight Loss		1.25 %	$162.13	
Plus Processing Cost		$3.25	$165.38	
Plus Labour Cost		$4.00	**$169.38**	
Finisher Ration:				
Barley	858.0	$110.00	$94.38	
Corn	0.0	$120.00	$0.00	
Soybean Meal - 47 %	110.0	$315.00	$34.65	
Vegetable Oil	10.0	$920.00	$9.20	
Limestone	11.5	$80.00	$0.92	
Dical (16-21)	4.0	$465.00	$1.86	
Salt - 96%	3.5	$120.00	$0.42	
G/F Micro	3.0	$2,500.00	$7.50	
Lysine HCL	0.0	$2,500.00	$0.05	
Threonine	0.0	$6,100.00	$0.00	
Total	**1,000.0 kg**		**$148.98**	
Adjusted For Weight Loss		1.25 %	$150.84	
Plus Processing Cost		$3.25	$154.09	
Plus Labour Cost		$4.00	**$158.09**	

Swine Hoop Structure Finishing Production Cost Worksheet

A. Operating Costs			Your Cost
1. Feed Requirements and Costs			
1.01 Grower Ration #1			
	27.0	weight gain/pig	
x	2.6	feed conversion ratio	
=	70.2	kg ration/pig	
x	$255.00	/tonne ration	
÷	1,000	kg/tonne	
x	12,000	weanlings purchased	
÷	11,527	pigs sold	
=	**$18.64**	**/pig sold**	
1.02 Grower Ration #2			
	30.0	weight gain/pig	
x	3.0	feed conversion ratio	
=	90.0	kg ration/pig	
x	$200.00	/tonne ration	
÷	1,000	kg/tonne	
x	12,000	weanlings purchased	
÷	11,527	pigs sold	
=	**$18.74**	**/pig sold**	
1.03 Finisher Ration			
	33.0	weight gain/pig	
x	3.6	feed conversion ratio	
=	118.8	kg ration/pig	
x	$190.00	/tonne ration	
÷	1,000	kg/tonne	
x	12,000	weanlings purchased	
÷	11,527	pigs sold	
=	**$23.50**	**/pig sold**	
2. Other Operating Costs			
2.01 Weanling Cost			
	$61.24	market price	
x	1.7	formula factor	
x	50	lbs	
+	$2.00	trucking cost	
x	12,000	weanlings purchased	
÷	11,527	pigs sold	
=	**$56.27**	**/pig sold**	

2.02 Straw

	12,000	number of pigs
	109	days on feed
	1.0	kg straw/pig/day
	$15.00	per bale
	700	kg/bale
	11,527	pigs sold
	$2.43	**/pig sold**

2.03 Veterinary Cost

	$1,000.00	professional services
+	$18,000.00	medication
+	11,527	pigs sold
=	**$1.65**	**/pig sold**

2.03 Maintenance & Repairs

	1.10	% of total capital investment
x	$264,656	total buildings and equipment cost
÷	11,527	pigs sold
=	$0.25	**/pig sold**

2.04 Utilities

	$1,000	hydro
+	$0	propane
÷	11,527	pigs sold
=	**$0.09**	**/pig sold**

2.05 Insurance

	$264,656	buildings & equipment
x	$0.46	/$100
÷	100	/$100 capital
÷	11,527	pigs sold
=	$0.11	/pig sold
	3,886	average # pigs in shelters
x	$118.00	average value
x	$0.65	/$100
÷	100	/$100 capital
÷	11,527	pigs sold
=	$0.26	/pig sold
=	**$0.36**	**/pig sold**

2.06 Manure Costs

	$30,000	annual cost
÷	11,527	pigs sold
=	**$2.60**	**/pig sold**

2.07 Office Supplies

	$0.30	/pig place	
x	3,886	pig places	
+	11,527	pigs sold	
=	**$0.10**	**/pig sold**	

2.08 Marketing & Transportation

	$2.50	trucking	
+	$0.85	universal levy	
+	$0.04	grading charge	
+	$0.65	truck washing	
+	$0.85	insurance	
+	$0.70	marketing levy	
=	**$5.59**	**/pig sold**	

2.09 Property Taxes

	$6,615	taxes	
	20	acres for pig operation	
	160	total acres	
÷	11,527	pigs sold	
=	**$0.07**	**/pig sold**	

2.10 Interest on Operating Cost

	$56.27	weaner cost	
x	120	total days to market	
x	8.50	% operating rate	
÷	365	days/year	
=	$1.57	/pig sold	
	$130.29	subtotal operating cost	
-	$56.27	weaner cost	
+	2	average	
x	120	total days to market	
÷	365	days/year	
x	8.50	% operating rate	
=	$1.03	/pig sold	
=	**$2.61**	**/pig sold**	

B. Fixed Costs

3. Depreciation

$$\frac{\text{Original cost - Salvage Value}}{\text{Useful Life}}$$

3.01 Buildings

	$180,656	total cost	
-	$0	salvage value	
÷	10	years useful life	
÷	11,527	pigs sold	
=	**$1.57**	**/pig sold**	

3.02 Equipment

	$84,000	total equipment cost	
-	$8,400	salvage value	
÷	10	years useful life	
÷	11,527	pigs sold	
=	**$0.65**	**/pig sold**	

4. Investment Cost

$$\frac{\text{(Original Cost + Salvage Value)}}{2} \text{ X Investment Rate}$$

4.01 Land

	$80,000	land investment	
x	5.00	% investment rate	
=	$4,000	investment cost	
-	$3,500	rental income	
÷	11,527	pigs sold	
=	**$0.30**	**/pig sold**	

4.02 Buildings

	$180,656	total cost	
+	$0	salvage value	
÷	2	average	
x	5.00	% investment rate	
÷	11,527	pigs sold	
=	**$0.39**	**/pig sold**	

4.03 Equipment

	$84,000	total equipment cost	_____
+	$8,400	salvage value	_____
÷	2	average	_____
x	5.00	% investment rate	_____
÷	11,527	pigs sold	_____
=	**$0.20**	**/pig sold**	_____

4.04 Other Costs

$30,000	site preparation	_____
$0.00	salvage value	_____
$2.00	average	_____
5.0	% investment rate	_____
11,527	pigs sold	_____
$0.07	**/pig sold**	_____

5. Labour Cost

	3432	total hours/year	_____
x	$12.00	/hour	_____
÷	11,527	pigs sold	_____
=	**$3.57**	**/pig sold**	_____

Summary of Purchased Feeds Used

11,644 Pigs available for marketing (includes lightweights)

	Total per Pig Mkt (kgs)	Total per Year (tonnes)	Total per Month (tonnes)	Total per Pig Mkt (lbs)
Grower 1 Ration	70.20	817.38	68.11	154.76
Grower 2 Ration	90.00	1,047.92	87.33	198.41
Finish Ration	118.80	1,383.26	115.27	261.91
Total	**279.00**	**3,248.56**	**270.71**	**615.08**

Summary of Home Mixed Feed Ingredients Used

	Total per Pig (kgs)	Total per Year (tonnes)	Total per Month (tonnes)	Total per Pig (lbs)
Barley	0.00	0.00	0.00	0.00
Corn	0.00	0.00	0.00	0.00
Soybean Meal - 47 %	0.00	0.00	0.00	0.00
Vegetable Oil	0.00	0.00	0.00	0.00
Limestone	0.00	0.00	0.00	0.00
Dical (16-21)	0.00	0.00	0.00	0.00
Salt - 96%	0.00	0.00	0.00	0.00
G/F Micro	0.00	0.00	0.00	0.00
Lysine HCL	0.00	0.00	0.00	0.00
Threonine	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**

For further information contact your local Manitoba Agriculture and Food office.

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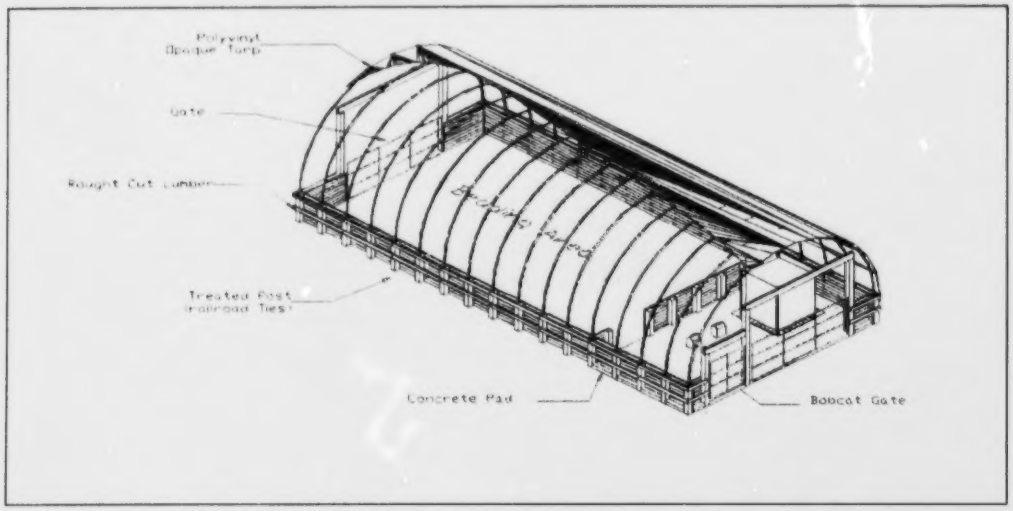
Figure 1 Common components of hoop structures



Estimated shelter costs for a 30 'x 102' structure

Tarp & hoops	$6,176
End doors	$740
4 Corner Panels	$260
Feeder 6 x 6 x 6	$1,225
Waterer (4-Hole)	$585
Heater Tubes	$55
Concrete	$700
Railroad Ties	$550
Planking	$500
Total	**$10,791**

Figure 2 Common layout of a grow finish structure